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AN
INAUGURAL ESSAY
ON
SCURVY.

SUBMITTED TO THE EXAMINATION OF

THE

REV. JOHN EWING, S. T. P. Provost,

THE

TRUSTEES, AND MEDICAL FACULTY OF THE
UNIVERSITY OF PENNSYLVANIA,

On the 22d day of May, 1798,

FOR THE DEGREE OF *DOCTOR OF MEDICINE:*

BY JOHN CLAIBORNE,

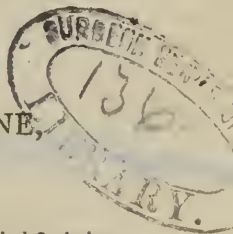
OF VIRGINIA,

Member of the Philadelphia Medical and Chemical Societies.

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1798.



Dr. Stuart, with the best wishes
of his fellow graduates
at the author

TO

BENJAMIN RUSH, M. D.

PROFESSOR OF THE INSTITUTES AND CLINICAL
MEDICINE,

IN THE

UNIVERSITY OF PENNSYLVANIA;

SIR,

MANY considerations point out the propriety of dedicating to you the following production. Besides the debt of gratitude due you by all the Republic of Medicine, for the many and important services you have rendered the science, which as an individual I feel very forcibly, obligations of a superior nature demand this tribute of respect from me. As a Preceptor and Teacher, from whose private as well as public instructions, I have derived most of the principles, which are to conduct me in the arduous task of alleviating the sufferings and afflictions of humanity, I am peculiarly indebted to you.

In the hasty and undigested performance to which your patronage is requested, you will discover an humble attempt to follow the principles, so successfully pursued by yourself in explaining the nature of Scurvy. I am sorry it is not more worthy your attention; but am confident that your goodness will induce you to look with an indulgent eye on all its imperfections, and make those allowances which it so much requires, and the occasion itself points out.

Whatever may be your opinion of its merits, I beg you to accept, Sir, the warmest wishes, for the long continuance of your health, and successful labours for the advancement of medicine, and the medical character of our common country, which will ever predominate in the breast of

Your affectionate

And grateful Pupil,

THE AUTHOR.

TO
ROBERT WALKER, M. D.
OF
VIRGINIA.

THIS Essay is respectfully Inscribed, not only in consideration of his high merit as a Gentleman, a Friend, and a Physician, for which he is so justly esteemed by all his acquaintances; but also as a grateful tribute of thanks for the valuable Instructions, and many marks of friendly Attention, bestowed, while he had the direction of the early medical pursuits of his

Affectionate Pupil,

And much obliged friend,

THE AUTHOR.

Introduction.

THE subject of the present Dissertation was chosen, not for the great connection it has with the immediate interest of this country, although the increase of our trade to distant quarters of the globe may, probably, render it an object of more concern in a short time; but from the difficulty of finding another, which has not already been so much hackneyed, both in Inaugural Dissertations, and in those of men of the first reputation in the medical world, as to have become uninteresting.

Notwithstanding much also has been said on Scurvy, and many different proximate causes have been assigned, none of them appear to be entirely accurate; and an attention to that part of the subject, not yet sufficiently attended to in any publication, shall be a principal object in the following observations. I shall follow my Preceptor, Dr. Rush, who has lately made it a state of fever*.

Perhaps further investigation may be thought by many of little importance, as the just knowledge of the cure of the disease has arrived at the utmost extent of success, to which we can well look forward; but even to these it may not be disagreeable to trace, in

* MS. Lectures.

the present instance, the uniformity and simplicity of Nature in all her operations.

For the history of the symptoms, and all the facts contained in the following sheets, I am indebted to the different authors who have treated on this subject. I am not conscious of having mistated them in any respect; and if I have been so unfortunate, it was without such an intention, and an indulgent public will attribute it to the short time I have been able to devote to the subject, and not to any want of candor.

Essay on Scurvy.

IT is necessary to premise that in treating of Scurvy, I shall not enter into the many trivial disputes, which have so much, and so uselessly engaged the attention of some of the Physicians who have written on the subject. I shall, however, just mention one or two of the points, on which there has been a diversity of opinion. Among these, researches into the antiquity of the disease have had no inconsiderable share of industry and ingenuity bestowed on them. Some have traced it back to the time of Hippocrates, while others deny that any traces can be found in his writings sufficient to fix their belief in the assertion that it was known to him; and the contest is not yet decided. But as it is a matter of no practical importance to determine it, I shall very easily be excused for passing over, without attempting to add to the uninteresting pages of the dispute.

The fruitful genius of Pathologists has not been idle in distinguishing this, like all other diseases, into a number of species, varying they supposed from different circumstances, not necessary to be mentioned here; nor has any thing been established on this point, as the standard of opinion, until within this

last half century. It appears however to be generally agreed on at present, that it is the same disease in every situation, whether at land or sea, differing only in degree from the greater or less violence of the causes producing it, and requiring the same method of cure. But without further notice of these subjects, I proceed to the history of the disease under consideration.

HISTORY.

IT is not intended, in this place, to give a very minute and circumstantial account of all the symptoms of Scurvy, in the precise order of their appearance, but merely a brief view of the most common and important phenomena, which present themselves, as collected from the writings of Boerhaave, Lind and others; and should any person wish more accurate information on this head, I beg leave to refer him to those authors.

Some physicians have called this a disease of cold climates principally, and there is, no doubt, reason to think them most favorable to the production of it; but fatal experience has demonstrated, that it may arise and prevail in any climate, by the concurrence of causes hereafter to be enumerated.

The first appearance of this malady is announced by the occurrence of a state of debility, in which the patient complains of unusual languor and lassitude, which is most remarkable after sleep, with

aversion from motion, the countenance assuming a pale, fallow, and bloated appearance. The respiration soon becomes difficult, and from a little exertion of body, a total suspension of that function is threatened. The knees grow stiff and feeble, and walking is performed with difficulty, from the pain which attacks most of the muscles, but principally those of the legs. The gums swell and bleed upon the least friction. On inspection they appear spongy and livid, and in the course of the disease, fungous and even putrid. Very early the breath is considerably foetid, but when the complaint has advanced, the stench is not only extremely disagreeable, but almost insupportable. Hæmorrhages take place from various parts; in the beginning they are trifling, and chiefly from the nose; but in the progress of the disorder, they proceed, not only from the surfaces, which are most subject to hæmorrhagy, but also from the skin itself, even where there is no sore. The skin is often dry and rough, but generally smooth, and shining spots of various colours and sizes appear on it, chiefly on the lower extremities and rarely on other parts. They are reddish and blue, or black and livid.

Wandering lancinating pains encreasing by night infest both the external and internal parts of the body, scarcely any being exempt. The head indeed does not suffer so much as other parts, except when there is considerable fever; but of all the body, the breast most.—It is not long before the legs and ancles become tumefied towards evening, the tumefaction at first disappearing before morning;

but at length they are more permanently affected. The tendons of the hams contract, and the muscles of the legs harden. Foul ulcers form on different parts, but principally on the legs. These are extremely obstinate, and refuse to yield to all external applications, and upon pressure readily become gangrenous. They do not afford a good pus, but a thin, foetid and ichorous discharge mixed with blood, which presently assumes the appearance of blood coagulated on their surface. Their edges are generally very livid. After some time they shoot out a bloody fungus, which, on being destroyed, returns again very speedily. They affect particularly parts that have been previously debilitated by a bruise, wound, or ulcer.

The disease running on in this way, all the symptoms encrease. The gums ulcerate and form large fungous granulations. The teeth are loosened in their sockets, so as nearly to prevent any food being taken, at least with ease, except such as is liquid. The patient often loses the power of moving his limbs. Frequent languors attack him, and after long confinement, he is subject to faint from the least motion. Some, from sudden exposure to fresh air immediately expire, and such is the state of debility, that a violent noise will often produce instant death.

The state of the bowels in this complaint is very various. Sometimes they are natural, sometimes costive, and in other cases very loose, accompanied with pain and a discharge of blood.

From the beginning, the appetite is good, and even in the latter stage it is not much impaired. There have even been instances of death taking place while the patient was in the act of mastication. The senses remain perfect, except that the spirits are generally low.

Towards the conclusion of this disease a dyspnoea takes place to a very violent degree, attended with tightness and oppression of the breast, which often terminates life very suddenly. The most general fatal termination is, in other diseases, or more properly in symptoms ascribed to them.

The state of the pulse in this disease is very various, and, indeed, it is hard to collect any thing satisfactory on the subject, as there is considerable difference of opinion as to the nature of the complaint; some authors, among whom Van Swieten and Dr Lind stand foremost, doubting, and even denying, that there is any fever essentially necessary for the production of Scurvy, alledging that the fevers which sometimes attend it are merely adventitious. This does not appear to have been the opinion of older writers, or even of Boerhaave, and I hope that hereafter, when I come to treat of the proximate cause, I shall be able to prove directly the reverse. But of this, more in a more proper place. In the mean time the state of the pulse would seem, as before observed, to be different in different cases. Wierus says that it was either small, hard, quick, or weak, and Dr. Donald Monroe gives us a case in the London Medical Transactions, in which it was so active as

to require feveral bleedings, being as he expreffes himfelf, “ quick, full, and ftrong.” From the whole however which I have collected, in the moft common cafes, where they proceeded flowly and regularly, the pulse, in the beginning, has been very little different from that of health, except being a little more feeble, flow*, and irregular, and, according to the ftage of the complaint, becoming ftill more weak and unequal. It is proper to remark, that fixed determinations on this point muft be liable to exception from a variety of caufes.

The appearance of the blood drawn in this difeafe is various. Dr. Lind did not find it differ much from what is natural in the beginning. It was fometimes covered with a buffy coat, and fometimes it did not feparate into ferum and craffamentum, and had a florid appearance. Kramer fays, that in his practice the blood did not feparate, but was covered with “ a white greafy film.” Some fpeak of it as being diffolved, but Rouppe never faw it fo except in one cafe, in which he fays it was combined with yellow fever†. The texture of it however, even when it does not feparate, is eafily broken down, and this is analagous to what we fhould expect.

A number of refpectable writers, and among thefe the juftly celebrated Boerhaave, have confidered Scurvy as contagious; while, on the other hand,

* Many of the old writers fpeak of the pulse as being quick, hence the propriety of not being pofitive.

† Rouppe on Dif eafes of Seamen.

the experienced Lind, whose opinions are always to be regarded, has given a different testimony; and other gentlemen of credit have concurred with him. But, although it is, without doubt, not so universally and certainly entitled to the appellation, as Boerhaave supposed; yet Dr. Lind's opinion appears to have been formed upon a survey of what is most common, and his conclusion of course too general, since there are not wanting facts, which would seem to prove that under certain circumstances it may be contagious, and the case of a Guineaman in the inhuman and disgraceful Slave Trade, mentioned by Dr. Trotter*, in which the first slaves that were taken on board, although numerous, remained some months before they became afflicted by it, whereas those who came on board after it had prevailed for some time, were attacked in a few days, is very much in support of that supposition. Other cases might be adduced to the same effect, but it is unnecessary; and from every view of the subject, it is presumed that there is nothing very inconsistent in the belief, that the effluvia arising from persons violently affected by the disease, may assist in the production of it in others.

REMOTE CAUSES.

In enumerating the remote causes of Scurvy, I feel no hesitation in placing at the head of the catalogue,

* See Trotter on Scurvy.

1st. An impure atmosphere.

2d. Peculiar kinds of diet.

3d. Too long an abstinence from vegetable food.

4th. Too great a degree of idleness or a want of due exercise.

5th. Depressing passions of the mind.

6th. Spiritous liquors.

7th, and lastly. All the remote causes of fever in general.

Some of these are strictly and properly exciting causes; but as a distinction is often difficult, and sometimes impracticable between remote and occasional or exciting causes, I shall not be accurate in separating them.

First, then, Of an impure atmosphere.—It would be sufficient to know the immense and all powerful agency of certain states of the air, as yet not clearly defined, in the production of the long train of maladies, which affect mankind, to conclude that in this case also, it must have considerable efficacy. We are not however, left to reason on this subject from analogy alone, and without any other conductor. The important conclusion rests on a more solid and substantial basis. Repeated experience has fully ascertained that certain states of the

weather, whether of moisture and cold, or moisture and heat*, have great influence over this complaint among soldiers and seamen. Dr. Lind has furnished us with a number of instances of this morbid state being produced as well as increased by cold and moist weather, and one case particularly, where there was a plentiful supply of fresh provisions, to which so much has been attributed in the prevention of it. Dr. R. Robertson gives us the case of a ship in which, after leaving a warm and moist climate, where the sailors had been much afflicted with Scurvy, and getting into one more dry and cold, they experienced the most eminent relief, and convalesced upon the same diet, they had before been using†.

These sensible qualities of the atmosphere certainly give a predisposition to disease in this as in other cases; but it seems very probable, that weather of the kind above mentioned is most prejudicial to seamen by causing vessels to be kept more close, and less ventilated, than in good weather, thereby rendering the air very impure and unfit for respiration. —Of the pernicious effects of the confined air of jails, ships, &c. little is requisite to be said. The vitiation is sometimes so considerable in vessels, as to produce death immediately by suffocation, as we are

* Whether cold and heat, alone and of themselves, without the aid of moisture, are equivalent to the originating of Scurvy is a question, in the solution of which we have not so many satisfactory testimonies to assist us; but it is imagined that either of them may be competent to produce a state of predisposition to it.

† See his Inaugural Dissertation, Edinburgh, 1765.

affured by Surgeon Renwick and Dr. Blanc. Sometimes, when not quite so considerable, it destroys newly impressed seamen in forty eight hours after coming on board, and very commonly gives rise to a violent and malignant fever. The injurious effects of an impure and foul atmosphere, are very clearly exhibited in the case of the *Guineaman* above noticed. I might here go on to enumerate the instances on record of impure air in the holds of ships occasioning this disease, but it would exceed the limits prescribed. I cannot, however pass unobserved the so much talked of marsh miasma. On this subject there are several observations meriting attention. The first is made by Lind, who has asserted, that in low fenny situations, persons living in the upper part of a house are less subject to the disease, than those who occupy the lower floor and cellar. It is also said to prevail in the neighbourhood of rivers that have overflowed their banks; and for this reason was formerly very common in Holland, where they suffered frequent inundations. It was once prevalent in the vicinity of a lake in Germany, and was very distressing; but since that lake has been dried up, it has entirely disappeared. Stronger evidence of a fact so notorious, and important cannot be wished or expected. The epidemic Scurvy in Hampshire in England*, probably owed its existence to marsh miasma. Perhaps also, there might have been something of contagion in this case.

The precise nature of those impurities, which, existing in the air, give rise to Scurvy, is not known.

* See Lind's Book on Scurvy.

They are probably various, and essentially different from each other, operating as I suppose, by a stimulant power, which, under different modifications and a difference of circumstances, produces all the peculiar effects which present themselves. The very ingenious Dr. Beddoes has attempted to account for all the symptoms of the disease, by supposing an abstraction of oxigene from the system, by which he thinks he can explain every thing respecting it *. He has, indeed, reasoned ingeniously, and deserves great credit for his attempt to apply the present elegant theory of chemistry to the explanation of the morbid appearances and phenomena in the animal œconomy; but although I look forward with pleasure for the time, when a happy application of chemical principles will astonish the world with more perfect explanations of the known, and detection of the at present unknown, laws of animated creation, I cannot think his theory sufficient for the present purpose. I will not deny, nay, I think it probable, that in the course of the disease the system may become incapable of taking in so much of that vital principle as is necessary; but cases have occurred, where no such circumstance as a defect of oxigene could have existed, and we are obliged to recur to other causes. Besides, it has been clearly and unequivocally proven by experiment, that fixed air, which we may very naturally conclude to be present in a very considerable proportion in the confined births and hold of a ship, does prove deleterious by a stimulant quality, if not entirely, yet very materially; nor will it be spinning

* See his Observations on Scurvy, &c.

our reasoning too far, or to a degree unwarrantable, to suppose that other contaminations of a badly constituted atmosphere act in a similar manner; and the matter is reduced almost to a certainty that is unquestionable, by a consideration of the consequences arising from exposure to them, but which need not be detailed in this place.—I cannot leave this subject without observing, that impure air has a most decided pre-eminence over all other causes in producing the complaint, as appears from a mass of proofs too numerous to mention. Much has been said of

Secondly, Peculiar kinds of diet.—Among these, most has been charged to the use of salt meats. The immortal Dr. Cullen has indeed attributed the disease almost entirely to the long use of salted provisions. Dr. Lind and several others of respectability deny that it is owing to the meat being salted, but rather to a degree of vitiation or corruption, which it suffers from long keeping and bad preservation, thereby becoming unfit for nutrition, by not affording sufficient nourishment to the body. From several trials, salt exhibited in form of sea water has appeared rather beneficial than otherwise to scorbutics, and the experience of the inhabitants of several countries, who use a large proportion of salted meats, and among these I would mention some of my fellow-citizens of Virginia and other southern states, whose food is principally of that kind, and who nevertheless, are not peculiarly disposed to Scurvy, is strongly opposed to the opinion of the

illustrious professor*. Besides, persons have often been confined a long time to sea diet, and have not been affected with scurvy, but upon returning into port, where they were supplied with an abundance of fresh vegetables, it has attacked them very severely†. There are likewise instances of the disease prevailing, where nothing but vegetable food was allowed, as in the case of the Guineaman alluded to above. Further, some facts prove that a defect of aliment may give rise to it, as was the case of Dr. Stark, when experimenting on different subjects relating to aliment ‡.

That salted meats, and other indigestible food may operate on the body, especially when predisposed by the influence of the air, as an occasional cause of the disease, no one can deny, and all that is here contended for is, that they do not demand so much attention in guarding against it, as the state of the air. They should without doubt, as much as possible, be avoided under circumstances of predisposition.

Thirdly, Too long abstinence from vegetable food.—It has been very well ascertained that food of

* Surgeon Thompson gives us an additional proof, in his judicious observations on this subject, against the opinion of salt being so active a cause, from the case of the people of the Shetland Islands, who, being deprived of their usual supply of vegetable food, were obliged to live on salted fish, and sea weeds, a whole winter, and yet escaped the Scurvy.

† Lind on Scurvy.

‡ See his Works.

this kind has considerable power in preventing the disease, and no small degree of efficacy in curing it; but it is equally true, that a very long discontinuance of the use of vegetables, has not created the consequences alledged, and it is likely, that where the person, without a full supply of them, is not exposed to impure air or some other cause of fever, he will very seldom suffer. It is also true, that even at a time when they were in plenty, that state of the system has taken place, which is fitted to give a scorbutic affection. This effect has been ascribed by some of the writers on the subject to a deficiency of nourishment, and it is by no means incredible, that this may give an aptitude to the system to be acted on by other causes, so as to produce the complaint; but a simple deficiency of nourishment is hardly adequate in itself to that purpose.

How far it is possible for a human being to retain his health under the exclusive use of animal food without vegetables, is not well determined; but it is very well known that fresh meats are so far from being chargeable with causing Scurvy, that the Laplanders, who live all winter on the fresh flesh of the rein deer, are entirely exempt from it. Thus also they cure Scurvy in Russia by the use of raw fresh meat, and the practice is not peculiar to them*.

* Dr. Rush informed me of a case of some American soldiers during the French war, as it was called, related to him by the late Dr. Morgan, where, from the sudden appearance of a superior force of French and Indians, they were obliged to shut themselves up in a fort without other food than some cattle, which were hastily collected. In a short time they were affected

Fourthly, Too great a degree of idleness, or a want of due exercise, are observed to be among the causes of this disorder.—From the known effect which such habits have in producing debility, we should not doubt of their influence, even if we were destitute of observations to prove it. But it is notorious, that the most idle and inactive are the most liable to suffer, and several gentlemen, whose opportunities for observation have been ample and extensive, assure us that marines are more subject to attack than sailors, and these last than the rowers. Exercise should not, however, be excessive, as it thence becomes prejudicial.

Fifthly, Depressing passions of the mind have been generally and justly accused as fruitful sources of this evil.—It would be needless to multiply authorities, but I will take notice of a few. Dr. Lind mentions several instances strongly illustrative of the truth of the position. One is from the journal of Mr. Ives, who gives an account of several ships, the crews of which were much afflicted with Scurvy, while at sea. Hearing that they were in a short time to engage the French and Spanish fleets, they were greatly elated, and recovered so fast, that in a few days,

with Scurvy to a violent degree. The effects of fresh meat in Russia and elsewhere, in curing the disease, forbid our ascribing it in this case solely to the meat, and Dr. Rush thinks it is very likely that fear and depression of the spirits assisted very much. Accordingly we shall hereafter find them not without effect.

The ingenious Professor of the Materia Medica in this University. Dr. Barton, in his lectures, inculcated strongly the curative powers of fresh meat in Scurvy, from several authorities.

when the engagement took place, they were all at their stations, except a very small number. They shortly after relapsed, which Dr. Lind attributes to the unfortunate event of the battle. He relates several other extraordinary cases to the same purpose. Dr. Robertson takes notice of some sailors, who, being on the recovery from the disease, and accidentally by bad weather and winds prevented entering the wished for port, suffered a return and increase of the symptoms, from which some died, although before they promised fair to recover. Rouppe furnishes a very strong proof of the general doctrine in the case of a sailor, who had no symptoms that could countenance an expectation of death. He happened to mention that he wished to be discharged, and being told that he would soon get well, and, further, that the officers would not discharge him; he replied, "I shall enter, but I shall soon die," and absolutely died that day. Vander Mye has recorded, that during the siege of Breda, good and bad news alternately diminished and increased the sufferings of the sick in a remarkable manner. In fine, such is the influence of the mind over the body in this dreadful calamity, that it is even said, that a medicine of little consequence sent and passed on a parcel of soldiers, as a specific by the Prince of Orange, afforded relief, while others of more importance had produced no effect.—These facts are sufficient to establish the baneful operation of depressing passions on real scorbutics; but it is likewise almost universally noticed by authors that impressed seamen are liable to be first attacked in a voyage, and no one can doubt that their wretched

situation is favorable to passions of the most truly depressing kind.—It is hardly necessary to observe, that they act negatively by the abstraction of the stimulating passions.

Sixthly, Spirituous liquors.—Roupepe, Lind, and Ellis have all borne a decided evidence against them. While every new research into the effects resulting from their abuse, gives us a fresh instance of their ravages, philanthropy is left to bewail the fate of man, obstinately pursuing his own ruin, in the face of the strongest evidence of impropriety, painted in the highest colours that can be given by the most eloquent powers, and supported by an hideous assemblage of facts too terrible to think of; all tending to prove their baneful consequences on the constitution and morals of every description of citizens, as well as of the unfortunate seaman.

Seventhly, and lastly, I must add all the remote causes of fever in general.—In this I am justified by the evidence of the Russian physician Nitzsch, who describes the disease as prevailing in the Russian army, and ascribes it only to the general causes of fever. He supposes with much seeming propriety, that they act gradually, and for a considerable time before they produce the complaint. It has already been remarked that Marsh Miasma, the fruitful cause of many fevers, is not innocent in this case.

Several other causes might be particularized, but they may very well be comprehended in what has

been said. I shall therefore omit further notice of them.

PREDISPOSING CAUSE.

THE predisposing cause of the disease is debility, whether constitutional, or artificial in consequence of debilitating causes acting on the body, either directly or indirectly. This is a point generally agreed on. It is remarked, *ceteris paribus*, to attack most quickly those who have been reduced by preceding indispositions. Fatigue, for the same reason, is very friendly to this scourge among soldiers and seamen. Nitzsch attributes the sufferings in the Russian army to this source in a considerable degree. To be short, debility is the predisposition from whatever cause it arises.

PROXIMATE CAUSE.

I come now to consider the proximate cause of Scurvy, a subject which has always been involved in considerable difficulty and darkness.—Even to name, without attempting to disprove all the theories hitherto brought forward, would far exceed the bounds I have prescribed myself. I must, however, pay some attention to a few of them.

In the first place, then, the very learned Sir John Pringle has placed the proximate cause in a gradual putrefaction of the fluids, meaning no doubt, the

blood in an especial manner. With respect to putrefaction of the blood circulating in a living animal, it is now put out of the question by the ingenious experiments of Dr. Seybert*. Before these, the doctrine had been strenuously opposed, and ably confuted by the judicious Dr. Milman†. Among many arguments, it has been urged with propriety, against the validity of this opinion, that a state of putrefaction so great as we should suppose must take place in this disease, upon the supposition that it originates from that cause, is more than we can reconcile to the existence of life even for a short time. Moreover, the effect of putrefaction is to dissolve the blood; very different, however, is the state of it, as appears from the observations of men, whose opportunities have been the most extensive and satisfactory in that respect. It is also particularly to be observed, that Lind found an equal quantity of the blood of a scorbutic did not putrify sooner than other blood under like circumstances of situation.

Dr. Cullen has laboured much to prove the proximate cause to be a saline acrimony of the blood, but his theory cannot be admitted, as it is contradicted by the experiments of Lind, who found the serum of scorbutic blood as mild and bland to the taste, as it ever is in any state of the constitution. It is true, that from some circumstances, as that of the milk of nurses, a long time refraining from nourishment, changing its quality considerably, it

* See his Inaugural Dissertation, Philadelphia, 1793.

† See his Enquiry into the Sources of Scurvy, &c.

may appear that the state of the blood differs sometimes from what is natural and common ; but it is still very improbable that it ever contracts any thing like an acrimony, while circulating in a system of vessels so readily taking the alarm from the presence of stimuli, the immediate consequence of which would be very violent commotions in them.

Dr. Milman, after attempting a refutation of these different hypotheses, has raised one of his own, more elegant and more simple, and I wish I could add that it was just, or consistent with the soundest reasoning on the principles of our late enlightened system of Physiology. He has made the diminution of the vital power, as he has called it, the proximate cause. Whatever this vital power may be, or on whatever quality or principle it depends for its existence, it is certain that it must be maintained through the medium of the blood-vessels ; and we presume with considerable confidence, that although there may be such an occurrence in the disease as a diminution of this power, it is rather a consequence or effect of the proximate cause, than what he has made it, the proximate cause itself ; and further, that any derangement in that respect, is the result of morbid action in the blood-vessels.

Dr. Rush has sufficiently established, that the primary seat of all ordinary fever is in the blood-vessels. He has also made Scurvy a state of fever, and, as I shall attempt to shew, with the utmost justice. If this be proven, it will result as a necessary inference, that not only the diminution of vital power, but all

other symptoms of this complaint, are the offspring of a derangement of the action in that system.

Some attention has already been paid to the beautiful explanation of the proximate cause by the supposed abstraction of oxigene from the system; but it demands further consideration.

It is a fact undeniable, and one that has been urged at some length, that in most instances a badly constituted atmosphere, whether confined to a small or extensive circle, has had the most eminent effect in giving rise to Scurvy, existing either as an epidemic, or in sporadic cases. How far there is a want of oxigene in such cases, is not easy to determine; but admitting it to be the case, it is still a desideratum of magnitude to know how such a state of the air operates on the body. Dr. Girtanner has supposed that oxigene is the principle of irritability, and is communicated from the blood to the muscular fibres. That it, or one of its constituent parts, becomes the principle of irritability, or excitability, in the animal œconomy, I am not prepared to deny or assert. Perhaps it may be so. If that supposition be admitted, may not its continued deficiency create such a state of the excitability of the system as to predispose to the peculiar action of Scurvy, from the application of stimuli of a particular degree of force? This may be the case at sea, and in confined unventilated places, and may be the reason of its more frequent prevalence in such situations; but it appears highly probable, that upon the application of certain causes, the action fitted to produce the disease may

occur in places where no defect of oxigene can be supposed to exist, as certainly as it does at sea or in the most confined and impure jails, &c. There are several cases to prove this last opinion. The much lamented Dr. Stark was afflicted with Scurvy, while experimenting upon vegetable diet alone, and when we cannot conceive that he was supplied with less oxigene than common. I shall pass over many instances which might be cited, in which it has occurred without a suspicion of any defect in the air; but it is presumed that the history of the disorder, in the Russian army, given by Nitzsch, is sufficient to disprove the doctrine of Beddoes. Upon the whole, although a deficiency of oxigene may have some influence in modifying the disease, yet it is probable, that even where it occurs, other qualities of the air also exert a power which is the principal agent in the production of this complaint, and this power may fairly be presumed of a stimulant nature. Hence other stimuli are competent to the same effect, where impure air does not exist.

But here let it not be supposed, that the doctrine already inculcated as to an impure atmosphere, is relinquished. On the contrary, it is still insisted, that although from other causes, a predisposition may arise sufficient to induce the scorbutic action by the intervention of an occasional cause, yet it is by far the most general source of the disease.

Notwithstanding I have thus ventured to differ from Dr. Beddoes, I indulge the pleasing hope, that his repeated and continued exertions will open a new

field to the physician; and that his further prosecution of pneumatic pathology will either confirm and extend his present theory, or detect its errors, and supply one more perfect in its place: and from the great interest he has taken in the advancement of medical science, we have every favorable presumption, that the establishment of truth will be more an object with him, than of any theory, however pleasing it may have been at first view, or however galling it may be to some minds to renounce first impressions, even when convinced of their impropriety.

It has already been hinted that Dr. Rush has made Scurvy a state of fever. This opinion strikes my mind as being the most just of any that has as yet been offered to the world. If it be true, the proximate cause of this state of fever must be the same as that of others. But as some may object to it, I shall be more definite, and assign the several reasons which give it a preference with me.

That it is a fever, I infer from several considerations, and

1st. Those who are most liable to it, being also most subject to fever.

2dly. From the same causes producing it, and other states of fever.

3dly. Its prevailing in the same places, and at the same time with them. And

4thly. From its being accompanied with more or less of the symptoms of common fever, more or less evident in every instance.

First, then, Are persons labouring under debility, from preceding sickness, depressed spirits, or in general, any cause whatever, more liable to fevers than others? So they are to Scurvy, as the free and full consent of all medical writers on the subject has satisfactorily evinced. This will be apparent in some measure from preceding observations; but were it necessary, I could adduce an accumulated weight of proofs, which, on a point so plain, would be superfluous.

Secondly, The same causes produce it, and other states of fever. On a review of the causes enumerated above, it will be perceived that there are none, but such as do often cause other states of fever. Thus it is certain, that impure air is the most frequent parent of fever, as well as of Scurvy, and it is especially to be observed, that marsh miasma has repeatedly been the source from whence this last has arisen. To mention more of the causes which are common to it and fever, might easily be dispensed with, but I cannot help again calling to recollection the case of the Russian army, which is so decisive on the subject. There is, moreover, another circumstance deserving attention, which is the great power cold has in predisposing the system both to one and the other*.

* It should be mentioned, that a Dutch physician, Solomon De Monchy, has fully and clearly proved the sameness of the

Thirdly, It prevails in the same places, and at the same time with fevers. Facts heretofore adduced for other purposes, present themselves here again. Scurvy is common in confined jails and army-hospitals; so is fever. Witness the many cases of their occurrence, at the same time with which we are furnished by navy and army surgeons. The works of Pringle, Lind, Blane, Thomson, Renwick, and Clark, not to mention many others, will afford all that we can wish on this point.—Marshy, fenny, and moist, also cold countries, suffer from fevers: so they do from Scurvy. To say no more, an instance of this last prevailing to any extent, where fevers of different grades do not show themselves, cannot be adduced.

Fourthly, It is accompanied with more or less of the symptoms of common fever, more or less evident in every instance. Here I am aware of the very weighty authority I have against me; but it must be observed, that our ideas of fever are much too limited; hence an increase of heat has been supposed necessary to its existence, whereas it will be found that as the name implies heat, it is improper, and is only to be used in conformity to custom*. Frequency of the pulse has also been considered inseparable from fever; now fever, or morbid excitement

causes of Scurvy, and other states of fever occurring on board West India vessels. He does not, however, contend that like them it is accompanied by fever, but is content with saying that the same remote causes produce a putrefaction of the blood, which he has made their common proximate cause.

* Dr. Rush's MS. Lectures.

in the blood-vessels, we know exists with natural, and even slow pulse. It is therefore impossible to confine fever to any particular species or grade of action in the arterial system, as indicated by the pulse; since in different cases it varies from the natural state in every way, from the greatest to an almost imperceptible degree. Thus it happens sometimes, that it may be slower and weaker than common, and yet the disease which it attends is called fever as certainly and justly as other cases prevailing at the same time, in which the reverse of this state of the pulse happens. Upon this ground, then, although Dr. Lind and many others have observed the pulse to be slower and more feeble in this disease than natural; I can discover no difficulty in granting it to be the effect of febrile action, notwithstanding it be not discriminated by all the most common symptoms of fever; and we are warranted in that belief by the actual appearance of very evident fever in some cases hereafter to be given, as well as by a strong analogy with other diseases. For instance, we see the same effects produced by different grades of action in different periods of time; as in the case of enlarged or obstructed liver, which arises either from violent bilious or yellow fever, from the intermittent fever, or from the action of the same causes, which produce them, being continued for a length of time in a degree of violence not equal to the origination of either of them in a clearly marked form, but sufficient to create considerable disease.

That the pulse is not very remarkably affected in the beginning of the complaint, it has been observed,

is not a valid objection to the opinion of its being a fever; as from the nature of the causes, and their gradual and long continued operation, it is to be expected that the system becomes insensible in a great degree, and the diseased action must of course be less obvious. Besides, we have seen that the pulse, even under these circumstances, has not failed to strike attentive observers as not being entirely natural. But if it was not so obviously affected as in most instances it is, we should not want an analogy of fevers of no inconsiderable violence, where the pulse has not deviated much from the natural standard. Prosper Alpinus and Riverius very particularly inculcate, that such a state of the pulse occurs sometimes when death is close at hand. And Dr. Blane has seen it so in jail and yellow fevers. He has also met with the same absence of thirst and heat of the skin in them, which attends Scurvy.

Among those who are persuaded that it is accompanied by no idiopathic fever, and that when fever presents itself it is merely adventitious, and not at all essential to the existence of the disease, are Dr. Lind and the Baron Van Swieten. Dr. Lind's own account would induce us to differ from him in the conclusion he has drawn, as he acknowledges that he had seen fever in the beginning of the disease; and in his observations on the pulse, he informs us it was generally slow and feeble. Still he supposed that the complaint was altogether of a chronic nature. The last position I shall not deny, however much too general it may be; but admitting it, I would still ask, what proximate cause of this chronic affection

can be alledged with so much probability as morbid and preternatural action in the blood-vessels? And I believe it would be difficult to find one equally plausible, and consistent with the general operations of a healthy or diseased system. The arguments of Van Swieten on this head, if they amount to any thing, militate against himself. He was very unfortunate in his selection of an illustration, when he asserted that Scurvy was not attended with fever in the beginning any more than dropsy: for since it has been very well ascertained, that dropsy seldom, or perhaps never exists without being accompanied with more or less fever, and he has denied a thing so well confirmed, it may very fairly be supposed that he was mistaken in both cases.

Different authors have given us proofs to establish the presence of evidence of fever before any proper scorbutic symptoms appear, and I shall take the liberty to mention some of them.

Mr. Murray, as we learn from Dr. Lind, saw several cases in which Scurvy was apparently the crisis of a fever. Kramer observed that it generally followed repeated attacks of fever, and that "it was always accompanied with remains of the fever in the pulse and in the urine," and further, that "it attacked only those, who, after frequent relapses and recovery from fevers, used crude viscid diet." Now, what is the common event of the use of such food in a debilitated state? Most certainly fever, more or less violent, with all its consequences.

Dr. Robertson, in his Inaugural Dissertation, expressly says, “*Sæpe febrem comitem scorbuti ineuntis vidi, sed antequam ejus natura certa ad huc erat.*”

That illustrious observer of nature, Dr. Sydenham, declared that he had seen the disorder as a symptom of quartan fever, and Eugeleus remarks the same as to a quotidian.

Dr. Donald Monro, in the London Medical Transactions, relates a case of the disease, where there was fever of considerable action from the beginning.

I might go on adding authorities of the kind without number, but it is impossible to attend to all. One more case I will notice from Dr. Huxham *. It was what he called a petechial fever, in which the resemblance in all the essential symptoms to Scurvy was so great, that every person must be struck with the evident connection between them, and agree that it affords at least a strong presumption in favour of the doctrine advocated in this essay.

Most of the authors, who take notice of what they call fever attending Scurvy, have supposed it to be symptomatic; which is not at all to be wondered at, since in most cases of fever accompanied with local affection, it was in almost every case fashionable to call the former the effect of the latter.

* See his Essay on Fevers, page 62.

Although I have thus quoted so many cases of fever very clearly marked, both accompanying and preceding Scurvy, and have by them sufficiently shewn, that it is sometimes produced by fevers of considerable force; I would by no means insinuate that the antecedent fever is always so evident. The reports of men of veracity forbid such a decision. It may, however, be concluded, that it is always preceded by some degree of fever. It seems to bear nearly the same relation to jail fever, that dropfy does to a remitting fever, or what are vulgarly called inward fevers in the southern states to an intermittent.

There are still many sources, from whence additional confirmation of our doctrine may be drawn. The blood sometimes, and that not unfrequently, exhibits a buffy coat; and if we attend to all the symptoms of the complaint, we have no reason to desert our conclusion. A few of them will answer the intention.

The symptoms common to Scurvy and fever, which I shall mention, are

1st. Pain.—This is so clear as to need no discussion. To what can we possibly attribute the violent lancinating pains which have been said to attack the various parts of the body of the scorbutic, but to a febrile action?

2dly. Costiveness or Diarrhoea.—These both occur in fevers, and also in Scurvy.

3dly. Hæmorrhagies, and 4thly. Petechiæ, are equally common to both cases.

5thly. Rotten gums and foetid breath, are likewise frequent in malignant fevers, as we have seen is the case in the complaint under consideration.

The appetite being good, is no objection, as has been supposed, to our idea. The same thing happens in consumption, and sometimes also in the last stage of yellow fever. The state of the pulse, as before stated, is equally, and upon the same principles, reconcileable with our theory, as a number of facts, in addition to those already noted, will prove*.

It is possible to trace the same connection of many other of the symptoms of the disease with fever, and to take many different views of the subject all tending to the same purpose, but I cannot consistently pursue it further.

* It must not be omitted to observe, that, in Vol. X. of Dr. Duncan's invaluable Commentaries, American edition, page 162, we have the relation of several cases, where petechiæ occurred, and in some of them hæmorrhagy also, without any symptoms of common fever preceding. During the prevalence of plague, persons are sometimes attacked with petechiæ, when they have had no intimation of the approach of the disease. Thus also, during the time of the yellow fever being epidemic, some are seized with hæmorrhagy from the nose, when walking the streets, before the occurrence of any other symptom to announce the coming on of the complaint. In all these cases, and particularly the last, we must suspect the presence of morbid action in the blood-vessels, or how shall we explain the phenomena?

Upon the whole, I conclude that Scurvy is as much entitled to be called a state of fever, as dropfy and many other diseases, whose claim is firmly established. The proximate cause therefore need not be repeated, as it is the same as that of ordinary fever, which is exhibited in another place, in a manner much more clear and satisfactory than can be expected from me.

CURE.

ON the cure of Scurvy, I shall be very concise, and only take notice of the most prominent indications. These are,

1st. To abstract all remote, exciting, and predisposing causes, and particularly foul air, to which so much has been attributed. For the purpose of keeping the air pure in the hold of a ship, a ventilator, contrived by Mr Benjamin Wynkoop of this city, seems to merit attention. It is simple, and takes up but little room, and at the same time appears to be very effectual. It has been highly recommended by the Academy of Medicine of Philadelphia, and from the reports of those captains who have used it, we are assured that it has been found very beneficial, in preserving the health, as well as the cargoes, of their vessels *.

* Captains, Geddes, Jones, and Irwin, have given certificates of their experience with this ventilator, and all unite in saying, that it was effectual, merely by the motion of the vessels, in expelling foul and supplying pure air to their holds; that the offensive smell of bilge water was prevented; that the perishable

2dly. To reduce the action of the system, when indicated by pain, the pulse, or habit of the patient. The remedies here are

First, Venesection.—This is not generally necessary, but it has been used frequently with advantage. Dr. Brown, in a letter to Dr. Guthrie *, mentions having used blood-letting, in the beginning, where there was pain in the side, with success.

Secondly, Gentle purges ; Thirdly, Diaphoretics ; and Fourthly, Diuretics.—These have all been found of considerable benefit by most physicians. Dr. Blane saw a striking instance of the salutary tendency of a spontaneous diarrhœa, which in the course of twelve hours removed the hard livid swellings of the legs and contraction of the hams of a scorbutic. This has its limits, however, in this as well as other diseases, beyond which it is hurtful.

3dly. To restore healthy excitement by gentle tonics. Pure air is here particularly useful. Vege-

part of their cargoes, and the paint of their cabins, were greatly preserved from the usual damage, by them ; and finally, that their crews were remarkably healthy. Captain Geddes particularly, has furnished a pointed proof of the advantage derived from the use of the ventilator, in the case of his crew, who were very healthy at the West-India port, where he discharged his cargo, while those of other vessels were very sickly, of whom many died.

* See American edition of Duncan's Medical Commentaries, vol. vi. page 438.

table aliment gently stimulating, as garlic, &c. is very serviceable. Pepper grass is especially worthy attention, since it can be raised at sea on cotton wetted with water *. Above all other vegetable productions the citric acid is of most importance. Other acids have also done good †. Some praise a solution of nitre in vinegar very highly. Sauer kraut and wort very justly deserve the notice of seamen.

Is bark proper here? It is too disproportioned to the state of the system. Dr. Poissonnier Desperrieres found it hurtful, and there are few testimonies much in its favor, while many have joined in declaring it useless. Is grog proper? It probably may be so in some cases. That it should assist in curing a disease as well as in the production of it, is by no means paradoxical. Most of our medicines are unnatural and hurtful to a person in health, however friendly to him when diseased: so it is as respects this great artificial evil of society, and no argument can be drawn in favour of its indiscriminate use from its curing diseases. As to wine, and malt liquors, their advantages are much greater and less equivocal. Lastly, chearful company, exhilarating passion, and

* Dr. Rush informed me that he once had his table plentifully supplied, in winter, with pepper grass raised in this way.

† Since writing the above I have received the fourth number of the Medical Repository, in which the oxygenated muriate of potash is mentioned as having cured Scurvy. My ingenious friend and fellow-graduate, Mr. Prioleau, has likewise informed me that he had used the oxygenated muriatic acid in scorbutic ulcers with success.

gentle exercise are of the most essential service, and highly important. In a word, the cure rests on the rejection of ancient forms of remedies, and a faithful and rational accommodation of them to the situation and state of the patient's system, regarding equally his body and mind.

THE END.

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